

CERTIFIED MAIL



July 1, 2008

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James Entzminger

Chemical Emergency Preparedness and Prevention Section (SC-6J)  
United States Environmental Protection Agency  
77 West Jackson Boulevard  
Chicago, Illinois 60604

**Re: Addendum 1 - Request for Information Pursuant to Section 104(e) of CERCLA for Aventine Renewable Energy, Inc., in Pekin, Illinois**

Dear Mr. Entzminger,

Aventine Renewable Energy, Inc. ("Aventine") responded to the USEPA's Section 104(e) CERCLA information request regarding a spill of sodium hydroxide at the Pekin facility on March 27, 2008. After further review Aventine discovered a mathematical error in the Section 104 (e) response. This letter is being submitted to identify and correct the questions that are effected by this error. Specifically, Aventine discovered that the pounds of sodium hydroxide released to the storm drain were over reported. The response to the Information Request noted that 10,042 pounds of sodium hydroxide were released. The correct amount is 6,407 pounds. The calculation totaling the amount of sodium hydroxide released did not factor in the quantity that remained in the evaporator. The questions that were effected by this mathematical error are attached.

If you have further questions do not hesitate to contact Steve Antonacci at (309) 347-9241.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jerry Weiland", is written over a horizontal line.

Jerry Weiland

Vice President of Operations

Enclosure: Addendum 1 – questions 17, 22, 24

17. The capacity of #1 evaporator is 10,000 gallons. The evaporator was empty after the rinse was completed.

a	12% sodium hydroxide solution	3,083
b	Methanator feed (rinse) water	8,030
c	6.5% sodium hydroxide solution	2,655
	Total into evaporator	13,768
d	Total collected in CIP tank	4,869
e	Total gallons out emergency vent	8,899
f	Gallons recovered	100
g	Total gallons released to storm drain	8,799

- a. The CIP tank has a capacity of 22,500 gallons. The operator tested the concentration of the CIP solution and confirmed it was 12% sodium hydroxide before sending the solution to the evaporator. The level on the CIP tank dropped 13.7% during the transfer to the evaporator.

$$22,500 \times 13.7\% = 3,083 \text{ gallons}$$

- b. The methanator supply tank has a capacity of 146,000 gallons. The level on the tank dropped 3.5% during the 15 minutes the methanator supply water was pumped to the evaporator. However, the calculation must include the volume that was also being sent to the methanator. The line to the methanator does not contain a flow transmitter. In order to calculate the flow to the methanator, the level on the methanator supply tank must be tracked for the same duration as the transfer but without the rinse cycle. During the 15 minutes immediately following the rinse cycle the methanator supply tank level went up by 2%. The combination of the two percentages is the true flow to the evaporator.

$$146,000 \times (3.5\% + 2.0\%) = 8,030 \text{ gallons}$$

- c. After the 12% solution was transferred from the CIP tank to the evaporator methanator feed (rinse) water was added to the CIP tank to dilute the solution to 6.5% in preparation for a CIP of the 'A' mash train coolers. The CIP tank level increased from 25.5% to 47.3%.

$$((25.5\%/47.3\%) \times 12\%) \times 100 = 6.5\% \text{ NaOH solution}$$

The CIP tank's level (with the 6.5% NaOH solution) dropped 11.8% when the flow was sent the 2<sup>nd</sup> time to the evaporator.

$$22,500 \times 11.8\% = 2,655 \text{ gallons}$$

- d. After the release, the evaporator was drained back to the CIP tank. The 6.5% NaOH solution in the CIP tank was transferred into another storage tank prior to sending the contents of the evaporator. The CIP tank level increased 21.6%.

$$22,500 \times 21.6\% = 4,869$$

- e. Total gallons into evaporator tank minus total gallons collected in CIP tank.  
 $3,083 + 8,030 + 2,655 = 13,768 - 4,869 = 8,899$  gallons lost
- f. The emergency vent discharge is horizontal 20 feet above the ground. When the solution impacted the gravel base it created 2 large depressions. The sodium hydroxide solution that remained in the puddles was captured with a sump pump.  
The first depression made was approximately 3 feet long by 2 feet wide, and was 1.5 feet deep or 9 cubic feet.  
 $2 \times 3 \times 1.5 = 9 \text{ ft}^3$   $9 \times 7.48 \text{ gal/ft}^3 = 67.3$  gallons.  
The second depression was approximately half the size, or 4.5 cubic foot.  
 $9 \text{ ft}^3 / 2 = 4.5 \text{ ft}^3$   
 $4.5 \times 7.48 \text{ gal/ft}^3 = 33.66$  gallons.  
 $67.3 + 33.7 = 100$  gallons collected
- g. Total gallons out emergency vent minus gallons recovered.  
 $8,899 - 100 = 8,799$  gallons

The concentration of the sodium hydroxide solution that was released has been determined to be 4.1%. This is based on the dilution of the original sodium hydroxide solution with water and the 6.5% NaOH solution.

3,083 gallons of 12%NaOH  
 $3,083 \times 12\% = 369.96$  gallons of NaOH  
2,655 gallons of 6.5%NaOH  
 $2,655 \times 6.5\% = 172.58$  gallons of NaOH  
 $369.96 + 172.58 = 542.54$  gallons of 100%NaOH  
 $(542.54 / 13,768 \text{ total gallons into evaporator}) \times 100 = 4.1\%$  sodium hydroxide

From that calculation it was determined that the reportable quantity (RQ) had been exceeded for sodium hydroxide. Sodium hydroxide has a RQ of 1000 lbs.

Specific Gravity of NaOH = 2.13  
Specific Gravity of water = 1  
1 gallon water = 8.34 lbs  
 $2.13 \times 8.34 \times 1 = 17.76$  lbs/gallon of NaOH  
 **$8,899 \text{ gallons} \times 4.1\% = 364.86 \text{ gallons of 100\% NaOH}$**

**$17.76 \times (364.86 \text{ gallons released} - 4.1 \text{ gallons collected}) = 6,407 \text{ lbs of sodium hydroxide released}$**

\*100 gallons recovered at 4.1%       $100 \times 4.1\% = 4.1$  gallons NaOH recovered

22. It is estimated that **6,407** pounds of sodium hydroxide was discharged to the storm drain. Refer to #17 for calculations.
24. Upon reaching the storm drain, the concentration of the sodium hydroxide is expected to be no more than 4.1%, as noted in response #17.

Upon reaching the NPDES permitted outfall at the Illinois River, the concentration was approximately 0.14 – 0.18%.

The release lasted for approximately 22 - 28 minutes. This will be discussed in the response to question #36.

The release entered a storm drain that combines with the blowdown streams from the dry mill cooling tower and boiler. This stream ties into the cooling water, waste water treatment effluent and storm water that discharges from the corn wet milling plant located on the same property. The estimated discharge from the total plant stream for the day was 28,108,000 gallons\*

$$28,108,000 / 24 \text{ hr} / 60 \text{ min} = 19,519 \text{ gallons per minute}$$
$$19,519 \text{ gpm} \times 8.34 \text{ lb/gal} = 162,789 \text{ lbs water per minute}$$

Pounds of sodium hydroxide released 6,407

$$\underline{6,407 / 22 \text{ minutes} = 291 \text{ lb/min}}$$

$$\underline{6,407 / 28 \text{ minutes} = 229 \text{ lb/min}}$$

$$\underline{(291 \text{ lb NaOH} / 162,789 \text{ lb H}_2\text{O}) \times 100 = 0.14\% \text{ NaOH}}$$

$$\underline{(229 \text{ lb NaOH} / 162,789 \text{ lb H}_2\text{O}) \times 100 = 0.18\% \text{ NaOH}}$$

\*The NPDES outfall has a flow totalizer that calculates the flow based on a Parshall Flume. However during the time of the release, the Illinois River was above the Flume which prevented the flow calculation to be determined. Aventine used the average flows from the last month of totalized flow values.